

## 2016 Massachusetts HIV/AIDS Epidemiologic Profile

### Detailed Data Tables: Who is dying with HIV/AIDS, and how has this changed over time?

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#### Recent changes to the presentation of Massachusetts HIV/AIDS surveillance data

Effective January 1, 2011, the Massachusetts Department of Public Health (MDPH), Bureau of Infectious Disease and Laboratory Sciences, HIV/AIDS fact sheets, epidemiologic reports and other HIV data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts. As of January 1, 2016, this resulted in the removal of 4,913 HIV/AIDS cases, of which 1,099 have died and 3,814 were living. These persons living with HIV infection may still continue to reside and receive care in the Commonwealth. The total number of persons living with HIV infection, regardless of location at diagnosis, is the basis for MDPH service planning. Please note that previous HIV/AIDS fact sheets, data reports and presentations included cases that may have been first diagnosed in another state.

Also effective January 1, 2011, the MDPH HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to eliminate the presumed heterosexual risk category for men; those cases have been reassigned to the no identified risk (NIR) category. The presumed heterosexual risk category was used with the intention of identifying HIV risk for women when sex with men is the only reported risk factor, there is no evidence of current or past injection drug use (IDU), and behavioral risk and HIV status information about male sexual partners are unknown. The rationale for the application of the presumed heterosexual risk category to women only has been addressed in the MDPH Office of HIV/AIDS report "Intersecting Risks: HIV Infection among Heterosexual Women and Men in Massachusetts." (2010) [http://www.mass.gov/Eeohhs2/docs/dph/aids/intersecting\\_risks.pdf](http://www.mass.gov/Eeohhs2/docs/dph/aids/intersecting_risks.pdf). The CDC reports men diagnosed with HIV infection who report sex with women as their only risk factor, without corresponding partner risk or HIV status information, in the NIR category. This revision to report presumed heterosexual male HIV/AIDS cases as NIR will bring Massachusetts HIV/AIDS case reporting for men in alignment with CDC standards. The MDPH will maintain presumed heterosexual and heterosexual risk categories for women.

To describe who is dying with HIV infection and how this has changed over time, these tables and the accompanying fact sheet present a profile of deaths during the ten-year period from 2005–2014 among individuals diagnosed with HIV infection. Additionally, information about deaths among people reported with AIDS for the ten-year period 2005 to 2014, as well as the years 1985, 1990, 1995, and 2000 is included for historical perspective. Death data are not available for people reported with HIV infection (non- AIDS) prior to 1999, as HIV infection was not a reportable condition before this time. Since 1999, the majority of annual deaths in persons diagnosed with HIV infection occur in persons who are reported with an AIDS diagnosis (ranging from 79% to 90%).

Death data presented in this analysis include all deaths among people reported with HIV infection or AIDS in Massachusetts. This includes deaths from all causes, including cardiovascular disease, liver disease, cancer, accidental injury, or poisoning inclusive of drug overdose. Therefore, the number of deaths reported here will vary from the number of HIV/AIDS deaths reported in *Massachusetts Deaths* by the Massachusetts Department of Public Health, Registry of Vital Records and Statistics, Bureau of Health Information, Statistics, Research and Evaluation.

On an annual basis, the HIV/AIDS Surveillance Program matches all reports of individuals living with HIV infection against that year's vital statistics file of all individuals who died in Massachusetts. Additionally, death certificates with HIV/AIDS among reported underlying conditions are received by the HIV/AIDS Surveillance Program, and providers may report deaths among their patients.

<b>Table 1. Number of deaths among persons reported with HIV infection (non-AIDS) and AIDS by year of death: Massachusetts, 1985–2014<sup>1</sup></b>			
	<b>HIV</b>	<b>AIDS</b>	<b>Total HIV + AIDS</b>
<b>Year of death</b>	<b>N</b>	<b>N</b>	
1985	-- <sup>2</sup>	118	-- <sup>2</sup>
1986	-- <sup>2</sup>	196	-- <sup>2</sup>
1987	-- <sup>2</sup>	316	-- <sup>2</sup>
1988	-- <sup>2</sup>	408	-- <sup>2</sup>
1989	-- <sup>2</sup>	539	-- <sup>2</sup>
1990	-- <sup>2</sup>	619	-- <sup>2</sup>
1991	-- <sup>2</sup>	787	-- <sup>2</sup>
1992	-- <sup>2</sup>	882	-- <sup>2</sup>
1993	-- <sup>2</sup>	1,010	-- <sup>2</sup>
1994	-- <sup>2</sup>	1,160	-- <sup>2</sup>
1995	-- <sup>2</sup>	1,133	-- <sup>2</sup>
1996	-- <sup>2</sup>	758	-- <sup>2</sup>
1997	-- <sup>2</sup>	372	-- <sup>2</sup>
1998	-- <sup>2</sup>	321	-- <sup>2</sup>
1999	49	337	386
2000	41	312	353
2001	60	356	416
2002	57	311	368
2003	68	323	391
2004	44	309	353
2005	54	279	333
2006	39	285	324
2007	44	242	286
2008	59	224	283
2009	51	236	287
2010	53	216	269
2011	38	196	234
2012	44	201	245
2013	45	195	240
2014	45	186	231

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> HIV infection reporting was implemented in 1999; therefore there are minimal data for deaths among people with HIV that did not progress to AIDS during this time period.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 2. Number and percentage of deaths among persons reported with HIV infection by exposure mode and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	MSM		IDU		MSM/ IDU		HTSX		Pres. HTSX <sup>2</sup>		Undeter- mined <sup>3</sup>		Total <sup>4</sup>
	N	%	N	%	N	%	N	%	N	%	N	%	N
2005	56	17%	172	52%	15	5%	39	12%	18	5%	31	9%	<b>333</b>
2006	63	19%	162	50%	19	6%	32	10%	16	5%	30	9%	<b>324</b>
2007	64	22%	125	44%	26	9%	28	10%	13	5%	25	9%	<b>286</b>
2008	59	21%	127	45%	15	5%	26	9%	11	4%	41	14%	<b>283</b>
2009	44	15%	144	50%	10	3%	36	13%	13	5%	39	14%	<b>287</b>
2010	60	22%	123	46%	14	5%	19	7%	10	4%	39	14%	<b>269</b>
2011	46	20%	98	42%	17	7%	24	10%	9	4%	37	16%	<b>234</b>
2012	53	22%	114	47%	12	5%	24	10%	11	4%	27	11%	<b>245</b>
2013	58	24%	101	42%	8	3%	22	9%	10	4%	37	15%	<b>240</b>
2014	60	26%	101	44%	9	4%	17	7%	14	6%	26	11%	<b>231</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Includes woman having sex with a man of unknown HIV status or risk. This category is limited to women only.

<sup>3</sup> Includes man having sex with a woman of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

<sup>4</sup> Totals include pediatric and blood/blood products exposure modes, and numbers suppressed for the assurance of confidentiality

MSM = Male-to-Male Sex; IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 3. Number and percentage of deaths among men reported with HIV infection by exposure mode and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	MSM		IDU		MSM/IDU		HTSX		Undetermined <sup>2</sup>		Total <sup>3</sup>
	N	%	N	%	N	%	N	%	N	%	N
2005	56	24%	119	51%	15	6%	14	6%	28	12%	<b>234</b>
2006	63	27%	108	47%	19	8%	11	5%	29	13%	<b>232</b>
2007	64	32%	78	39%	26	13%	9	4%	22	11%	<b>201</b>
2008	59	29%	83	40%	15	7%	13	6%	33	16%	<b>207</b>
2009	44	23%	94	48%	10	5%	13	7%	33	17%	<b>195</b>
2010	60	31%	76	40%	14	7%	6	3%	32	17%	<b>191</b>
2011	46	27%	62	37%	17	10%	10	6%	33	20%	<b>169</b>
2012	53	32%	71	43%	12	7%	5	3%	25	15%	<b>167</b>
2013	58	32%	68	38%	8	4%	7	4%	35	20%	<b>179</b>
2014	60	34%	74	43%	9	5%	7	4%	23	13%	<b>174</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Includes men having sex with a woman of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

<sup>3</sup> Totals include pediatric and blood/blood products exposure modes and numbers suppressed for the assurance of confidentiality.

MSM = Male-to-Male Sex; IDU = Injection Drug Use; MSM/IDU = Male-to-Male Sex and Injection Drug Use; HTSX = Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 4. Number and percentage of deaths among women reported with HIV infection by exposure mode and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	IDU		HTSX		Pres. HTSX <sup>2</sup>		Undetermined <sup>3</sup>		Total <sup>4</sup>
	N	%	N	%	N	%	N	%	N
2005	53	54%	25	25%	18	18%	3	3%	<b>99</b>
2006	54	59%	21	23%	16	17%	1	1%	<b>92</b>
2007	47	55%	19	22%	13	15%	3	4%	<b>85</b>
2008	44	58%	13	17%	11	14%	8	11%	<b>76</b>
2009	50	54%	23	25%	13	14%	6	7%	<b>92</b>
2010	47	60%	13	17%	10	13%	7	9%	<b>78</b>
2011	36	55%	14	22%	9	14%	4	6%	<b>65</b>
2012	43	55%	19	24%	11	14%	2	3%	<b>78</b>
2013	33	54%	15	25%	10	16%	2	3%	<b>61</b>
2014	27	47%	10	18%	14	25%	3	5%	<b>57</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Includes woman having sex with a man of unknown HIV status or risk. This category is limited to women only.

<sup>3</sup> Includes those still being followed up for risk information, those who have died with no determined risk and those lost to follow-up.

<sup>4</sup> Totals include pediatric and blood/blood products exposure modes and numbers suppressed for the assurance of confidentiality

IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 5. Number and percentage of deaths among persons reported with HIV infection by race/ethnicity and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	White (NH)		Black (NH)		Hispanic/Latino		API		Total <sup>2</sup>
	N	%	N	%	N	%	N	%	N
2005	154	46%	88	26%	88	26%	3	1%	<b>333</b>
2006	172	53%	77	24%	73	23%	2	1%	<b>324</b>
2007	146	51%	78	27%	61	21%	1	<1%	<b>286</b>
2008	139	49%	76	27%	62	22%	5	2%	<b>283</b>
2009	135	47%	74	26%	72	25%	6	2%	<b>287</b>
2010	122	45%	68	25%	72	27%	3	1%	<b>269</b>
2011	113	48%	67	29%	53	23%	0	0%	<b>234</b>
2012	122	50%	60	24%	58	24%	3	1%	<b>245</b>
2013	117	49%	66	28%	54	23%	2	1%	<b>240</b>
2014	105	45%	62	27%	58	25%	2	1%	<b>231</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Totals include American Indian/Alaskan Native individuals, those of other or undetermined race/ethnicity and numbers suppressed for the assurance of confidentiality

(NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 6. Number and percentage of deaths among men reported with HIV infection by race/ethnicity and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	White (NH)		Black (NH)		Hispanic/Latino		API		Total <sup>2</sup>
	N	%	N	%	N	%	N	%	N
2005	113	48%	56	24%	62	26%	3	1%	<b>234</b>
2006	135	58%	46	20%	49	21%	2	1%	<b>232</b>
2007	116	58%	38	19%	46	23%	1	<1%	<b>201</b>
2008	110	53%	53	26%	38	18%	5	2%	<b>207</b>
2009	89	46%	53	27%	47	24%	6	3%	<b>195</b>
2010	92	48%	42	22%	53	28%	2	1%	<b>191</b>
2011	85	50%	46	27%	37	22%	0	0%	<b>169</b>
2012	91	54%	35	21%	37	22%	3	2%	<b>167</b>
2013	92	51%	41	23%	43	24%	2	1%	<b>179</b>
2014	84	48%	40	23%	45	26%	2	1%	<b>174</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Totals include American Indian/Alaskan Native individuals, those of other or undetermined race/ethnicity and numbers suppressed for the assurance of confidentiality

(NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 7. Number and percentage of deaths among women reported with HIV infection by race/ethnicity and year of death: Massachusetts<sup>1</sup>, 2005–2014**

	White (NH)		Black (NH)		Hispanic/Latina		API		Total <sup>2</sup>
	N	%	N	%	N	%	N	%	N
2005	41	41%	32	32%	26	26%	0	0%	<b>99</b>
2006	37	40%	31	34%	24	26%	0	0%	<b>92</b>
2007	30	35%	40	47%	15	18%	0	0%	<b>85</b>
2008	29	38%	23	30%	24	32%	0	0%	<b>76</b>
2009	46	50%	21	23%	25	27%	0	0%	<b>92</b>
2010	30	38%	26	33%	19	24%	1	1%	<b>78</b>
2011	28	43%	21	32%	16	25%	0	0%	<b>65</b>
2012	31	40%	25	32%	21	27%	0	0%	<b>78</b>
2013	25	41%	25	41%	11	18%	0	0%	<b>61</b>
2014	21	37%	22	39%	13	23%	0	0%	<b>57</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Totals include American Indian/Alaskan Native individuals, those of other or undetermined race/ethnicity and numbers suppressed for the assurance of confidentiality

(NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change



## Explanation of rates

A “rate” of a disease per 100,000 population is a useful way to compare groups that have substantially different population sizes. To adjust for fluctuations in the annual rate of death among people reported with HIV infection, an average annual rate of death for the period 2012 to 2014 is used. The average number of deaths is calculated over the three-year period by adding the total number of deaths among people reported with HIV infection in each of the three years and dividing by three. The crude average annual rate of death is then calculated by dividing the average number of people reported with HIV infection who died during the three years by the entire population (everyone or the sub-population involved) and multiplying by 100,000. (See example 1 below). The Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010 file is the source of population sizes for these calculations.

### **Example 1: Calculation of Crude Average Annual Rate of Death among People Reported with HIV infection for White Individuals, Massachusetts, 2012–2014 (2.2 per 100,000)**

Crude average annual rate of death among reported HIV/AIDS cases for white individuals, 2012–2014	= (((number of white individuals reported with HIV infection who died in 2011 + number of white individuals reported with HIV infection who died in 2012 + number of white individuals reported with HIV infection who died in 2013) ÷ 3) ÷ population size of white individuals) × 100,000
	= (((122 + 117 + 105) ÷ 3) ÷ 5,132,633) × 100,000
	= ((344 ÷ 3) ÷ 5,132,633) × 100,000
	= (114.6667 ÷ 5,132,633) × 100,000
	= 0.00002234071 × 100,000
	= <b>2.1</b>

However, sometimes, in addition to the population size being different, the age composition of the populations is different. In Massachusetts, black (non-Hispanic) and Hispanic/Latino populations are generally younger than the white (non-Hispanic) population. The median age of black (non-Hispanic) people (29.7 years) and Hispanic/Latino people (24.5 years) is younger than that of white (non-Hispanic) people (38.8 years). Therefore, an appropriate comparison requires “age-adjustment” of the HIV/AIDS prevalence rate to get a true comparison of the impact of the disease across racial/ethnic groups without an effect from the differences in age composition. Age-adjustment of rates minimizes the distortion created by differences in age composition.

Age-adjusted rates are calculated by multiplying the age-specific rates for a given population by the age distribution of a standard population. The weighted age-specific rates are then added to produce the adjusted rate for all ages combined. (See example 2 below).

**Example 2: Calculation of Age-adjusted Rate of Death among People Reported with HIV infection for White Individuals, Massachusetts, 2012–2014, (1.8 per 100,000)**

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
Age group (in years)	Average number of deaths among reported HIV/AIDS cases 2012–2014	Population (2010)	2000 US standard population weight	Age-adjusted rate ((B÷C×D)×100,000))
<1	0	48,010	0.013818	0.00
1-4	0	200,452	0.055317	0.00
5-14	0	571,967	0.145565	0.00
15-24	0.333333	677,899	0.138646	0.01
25-34	2	603,245	0.135573	0.04
35-44	8	676,064	0.162613	0.19
45-54	50.66667	841,315	0.134834	0.81
55-64	40.33333	697,852	0.087247	0.50
65-74	11.66667	403,518	0.066037	0.19
75-84	1.66667	275,380	0.044842	0.03
85+ years	0	136,931	0.015508	0.00
<b>Total</b>	114.6667	5,132,633	1	<b>1.77</b>

To see the effect of age-distribution on rates of death see Table 8 below for a comparison of crude and age-adjusted rates by race/ethnicity.

**Table 8. Crude and age-adjusted rates of death among people reported with HIV infection per 100,000 population<sup>1</sup> by race/ethnicity and sex at birth: average annual rate 2012–2014, Massachusetts<sup>2</sup>**

<b>State Total, N=716:</b>	<b>Crude Rate per 100,000</b>	<b>Age-Adjusted Rate per 100,000</b>
White (non-Hispanic)	2.2	1.8
Black (non-Hispanic)	15.1	16.0
Hispanic/Latino	9.0	12.3
<b>Mass. Total Rate</b>	<b>3.6</b>	<b>3.2</b>
<b>Men, N=520:</b>	<b>Crude Rate per 100,000</b>	<b>Age-Adjusted Rate per 100,000</b>
White (non-Hispanic) Men	3.6	2.9
Black (non-Hispanic) Men	19.3	21.9
Hispanic/Latino Men	13.5	20.1
<b>Mass. Total Rate Among Men</b>	<b>5.5</b>	<b>4.8</b>
<b>Women, N=196:</b>	<b>Crude Rate per 100,000</b>	<b>Age-Adjusted Rate per 100,000</b>
White (non-Hispanic) Women	1.0	0.8
Black (non-Hispanic) Women	11.2	11.3
Hispanic/Latina Women	4.7	5.9
<b>Mass. Total Rate Among Women</b>	<b>1.9</b>	<b>1.7</b>
<sup>1</sup> The denominators for rate calculations are from the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010; all rates are age-adjusted using the 2000 US standard population. <sup>2</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts. Data Source: MDPH HIV/AIDS Surveillance Program; data are current as of 3/1/16 and may be subject to change		

**Table 9. Number and percentage of deaths among persons reported with HIV infection by sex at birth and year of death: Massachusetts<sup>1</sup>, 2005–2014**

Year of death	Men		Women		Total
	N	%	N	%	N
2005	234	70%	99	30%	333
2006	232	72%	92	28%	324
2007	201	70%	85	30%	286
2008	207	73%	76	27%	283
2009	195	68%	92	32%	287
2010	191	71%	78	29%	269
2011	169	72%	65	28%	234
2012	167	68%	78	32%	245
2013	179	75%	61	25%	240
2014	174	75%	57	25%	231

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.  
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 10. Number and percentage of deaths among persons reported with HIV infection by place of birth and year of death: Massachusetts<sup>1</sup>, 2005–2014**

Year of Death	US		Puerto Rico/ US Dependency <sup>2</sup>		Non-US		Total
	N	%	N	%	N	%	N
2005	245	74%	62	19%	26	8%	333
2006	249	77%	46	14%	29	9%	324
2007	229	80%	35	12%	22	8%	286
2008	208	73%	40	14%	35	12%	283
2009	218	76%	38	13%	31	11%	287
2010	204	76%	42	16%	23	9%	269
2011	173	74%	37	16%	24	10%	234
2012	198	81%	25	10%	22	9%	245
2013	185	77%	31	13%	24	10%	240
2014	169	73%	38	16%	24	10%	231

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Ninety-nine percent of people diagnosed with HIV infection from 2005–2014 who were born in a US dependency were born in Puerto Rico, 1% were born in US minor outlying areas <1% were born in the US Virgin Islands, and <1% were born in Guam.  
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

**Table 11. Number and percentage of deaths among persons reported with HIV infection by age at death and year of death: Massachusetts<sup>1</sup>, 2005–2014<sup>2</sup>**

Year	<13		13–19		20–24		25–29		30–34		35–39		40–44		45–49		50–54		55–59		60+		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
2005	6	2%	0	0%	3	1%	5	2%	19	6%	27	8%	85	26%	77	23%	55	17%	32	10%	24	7%	<b>333</b>
2006	0	0%	0	0%	0	0%	3	1%	7	2%	38	12%	73	23%	77	24%	66	20%	31	10%	29	9%	<b>324</b>
2007	1	<1%	0	0%	2	1%	6	2%	7	2%	28	10%	45	16%	66	23%	64	22%	32	11%	35	12%	<b>286</b>
2008	1	<1%	1	<1%	1	<1%	6	2%	7	2%	24	8%	49	17%	60	21%	52	18%	38	13%	44	16%	<b>283</b>
2009	0	0%	0	0%	0	0%	2	1%	6	2%	14	5%	45	16%	58	20%	64	22%	44	15%	54	19%	<b>287</b>
2010	0	0%	0	0%	1	<1%	4	1%	6	2%	12	4%	42	16%	47	17%	56	21%	48	18%	53	20%	<b>269</b>
2011	0	0%	1	<1%	2	1%	0	0%	3	1%	15	6%	27	12%	48	21%	42	18%	47	20%	49	21%	<b>234</b>
2012	0	0%	0	0%	3	1%	2	1%	3	1%	9	4%	20	8%	41	17%	65	27%	37	15%	65	27%	<b>245</b>
2013	0	0%	0	0%	2	1%	2	1%	4	2%	5	2%	11	5%	44	18%	55	23%	48	20%	69	29%	<b>240</b>
2014	0	0%	0	0%	1	<1%	6	3%	11	5%	7	3%	15	6%	39	17%	36	16%	54	23%	62	27%	<b>231</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Reflects year of HIV infection diagnosis among all individuals reported with HIV infection, with or without an AIDS diagnosis for the most recently available 10 year period after the implementation of HIV infection reporting in 1999.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data are current as of 3/1/16 and may be subject to change

## **Technical Notes: Trends in survival after an AIDS diagnosis**

The following analyses describe changes over time in the survival of people who are diagnosed with AIDS in Massachusetts.

Tables 13–17 describe how many people died within 1 year of an AIDS diagnosis, between 1 and 2 years, between 2 and 3 years, etc., and up to 10 or more years for all people diagnosed with AIDS from 1987 to 2008. For example, the first column of Table 13 indicates that of 628 people diagnosed with AIDS in 1987, 250, or 40%, died within 1 year of diagnosis; 157, or 25%, died between 1 and 2 years of diagnosis; and 90, or 14%, died between 2 and 3 years of diagnosis.

It should be noted that if a person was diagnosed with AIDS in 2008, only one complete year of survival can be assessed, since this report includes data only up to January 1, 2010. Likewise, a diagnosis of AIDS in 2007 would not allow observation for more than two years, etc. These observations are relevant when interpreting the following tables and especially when comparing the distribution of survival times across years. With these caveats in mind, there has been a fairly consistent decline in the percentage of people who die within two years of an AIDS diagnosis. This most likely reflects higher rates of early diagnosis and improved care and treatment of people living with AIDS in the Commonwealth.

In comparing survival for people diagnosed in 1988 with people diagnosed in more recent years, it is evident that the proportion of people who are still alive is greater for each successive time period. More people are surviving for longer time periods after being diagnosed with AIDS. Advances in the prevention of opportunistic infections and the treatment of HIV infection over the years account for this significant increase in survival.

**Table 12. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 1987–1991**

	1987		1988		1989		1990		1991	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%	N	%
<1 yr.	250	40%	257	31%	264	28%	272	26%	340	26%
1 - <2 yr.	157	25%	199	24%	216	23%	207	20%	297	23%
2 - <3 yr.	90	14%	139	17%	167	17%	192	18%	204	16%
3 - <4 yr.	44	7%	69	8%	85	9%	113	11%	114	9%
4 - <5 yr.	16	3%	35	4%	63	7%	63	6%	70	5%
5 - <6 yr.	11	2%	25	3%	43	4%	39	4%	35	3%
6 - <7 yr.	8	1%	12	1%	17	2%	14	1%	12	1%
7 - <8 yr.	5	1%	13	2%	7	1%	9	1%	13	1%
8 - <9 yr.	9	1%	3	0%	4	0%	11	1%	10	1%
9 - <10 yr.	0	0%	2	0%	5	1%	7	1%	6	0%
10+ yr.	10	2%	21	3%	30	3%	41	4%	51	4%
Still Alive	29	5%	61	7%	59	6%	84	8%	152	12%
<b>Total</b>	<b>629</b>	<b>100%</b>	<b>836</b>	<b>100%</b>	<b>960</b>	<b>100%</b>	<b>1052</b>	<b>100%</b>	<b>1,304</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change

**Table 13. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 1992–1996**

	1992		1993		1994		1995		1996	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%	N	%
<1 yr.	333	20%	325	19%	266	19%	194	15%	97	9%
1 - <2 yr.	362	21%	347	20%	246	17%	94	7%	45	4%
2 - <3 yr.	297	18%	253	15%	115	8%	56	4%	53	5%
3 - <4 yr.	170	10%	110	6%	51	4%	50	4%	39	3%
4 - <5 yr.	59	4%	47	3%	35	2%	40	3%	42	4%
5 - <6 yr.	32	2%	34	2%	41	3%	31	2%	37	3%
6 - <7 yr.	35	2%	32	2%	26	2%	36	3%	34	3%
7 - <8 yr.	16	1%	32	2%	43	3%	44	3%	23	2%
8 - <9 yr.	32	2%	21	1%	25	2%	28	2%	24	2%
9 - <10 yr.	21	1%	22	1%	17	1%	27	2%	18	2%
10+ yr.	105	6%	127	7%	145	10%	143	11%	138	12%
Still Alive	222	13%	356	21%	410	29%	591	44%	587	52%
<b>Total</b>	<b>1,684</b>	<b>100%</b>	<b>1,706</b>	<b>100%</b>	<b>1,420</b>	<b>100%</b>	<b>1,334</b>	<b>100%</b>	<b>1,137</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change

**Table 14. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 1997–2001**

	1997		1998		1999		2000		2001	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%	N	%
<1 yr.	68	8%	52	6%	59	7%	54	7%	62	9%
1 - <2 yr.	38	4%	39	4%	31	3%	18	2%	23	3%
2 - <3 yr.	33	4%	19	2%	34	4%	26	3%	22	3%
3 - <4 yr.	28	3%	23	2%	22	2%	19	2%	14	2%
4 - <5 yr.	39	4%	27	3%	27	3%	22	3%	16	2%
5 - <6 yr.	24	3%	26	3%	18	2%	25	3%	20	3%
6 - <7 yr.	23	3%	24	3%	17	2%	13	2%	10	1%
7 - <8 yr.	22	2%	28	3%	17	2%	11	1%	12	2%
8 - <9 yr.	21	2%	18	2%	19	2%	10	1%	7	1%
9 - <10 yr.	20	2%	18	2%	12	1%	15	2%	13	2%
10+ yr.	93	10%	85	9%	74	8%	48	6%	16	2%
Still Alive	497	55%	562	61%	557	63%	515	66%	489	69%
<b>Total</b>	<b>906</b>	<b>100%</b>	<b>921</b>	<b>100%</b>	<b>887</b>	<b>100%</b>	<b>776</b>	<b>100%</b>	<b>704</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

<sup>3</sup> Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change

**Table 15. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 2002–2006**

	2002		2003		2004		2005		2006	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%	N	%
<1 yr.	43	6%	41	7%	49	7%	39	6%	35	5%
1 - <2 yr.	20	3%	18	3%	21	3%	11	2%	10	1%
2 - <3 yr.	15	2%	9	1%	15	2%	10	1%	9	1%
3 - <4 yr.	19	3%	13	2%	16	2%	7	1%	5	1%
4 - <5 yr.	12	2%	14	2%	11	2%	14	2%	6	1%
5 - <6 yr.	13	2%	10	2%	8	1%	16	2%	9	1%
6 - <7 yr.	16	2%	13	2%	9	1%	8	1%	5	1%
7 - <8 yr.	9	1%	7	1%	5	1%	7	1%	5	1%
8 - <9 yr.	6	1%	6	1%	11	2%	11	2%	6	1%
9 - <10 yr.	7	1%	12	2%	8	1%	5	1%	-- <sup>3</sup>	-- <sup>3</sup>
10+ yr.	18	3%	12	2%	6	1%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
Still Alive	517	74%	468	75%	543	77%	569	82%	592	87%
<b>Total</b>	<b>695</b>	<b>100%</b>	<b>623</b>	<b>100%</b>	<b>702</b>	<b>100%</b>	<b>697</b>	<b>100%</b>	<b>682</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

<sup>3</sup> Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change



**Table 16. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 2007–2010**

	2007		2008		2009		2010	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%
<1 yr.	27	5%	32	7%	26	5%	30	7%
1 - <2 yr.	19	3%	9	2%	4	1%	4	1%
2 - <3 yr.	8	1%	7	1%	8	2%	8	2%
3 - <4 yr.	5	1%	5	1%	11	2%	6	1%
4 - <5 yr.	7	1%	7	1%	9	2%	1	<1%
5 - <6 yr.	7	1%	5	1%	2	<1%	-- <sup>3</sup>	-- <sup>3</sup>
6 - <7 yr.	5	1%	9	2%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
7 - <8 yr.	2	<1%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
8 - <9 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
9 - <10 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
10+ yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
Still Alive	490	86%	404	85%	419	87%	386	89%
<b>Total</b>	<b>570</b>	<b>100%</b>	<b>478</b>	<b>100%</b>	<b>479</b>	<b>100%</b>	<b>435</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

<sup>3</sup> Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change

**Table 17. Number and percentage distribution of AIDS diagnoses by time from AIDS diagnosis to death and year of AIDS diagnosis: Massachusetts<sup>1</sup>, 2011–2014**

	2011		2012		2013		2014	
Survival time <sup>2</sup>	N	%	N	%	N	%	N	%
<1 yr.	23	5%	13	3%	20	5%	13	5%
1 - <2 yr.	8	2%	6	1%	3	1%	1	<1%
2 - <3 yr.	5	1%	5	1%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
3 - <4 yr.	4	1%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
4 - <5 yr.	1	<1%	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
5 - <6 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
6 - <7 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
7 - <8 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
8 - <9 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
9 - <10 yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
10+ yr.	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>	-- <sup>3</sup>
Still Alive	393	91%	414	95%	343	94%	256	95%
<b>Total</b>	<b>434</b>	<b>100%</b>	<b>438</b>	<b>100%</b>	<b>366</b>	<b>100%</b>	<b>270</b>	<b>100%</b>

<sup>1</sup> Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases for all years presented that were first diagnosed in another state before being reported in Massachusetts.

<sup>2</sup> Years between AIDS diagnosis and death

<sup>3</sup> Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data are current as of 3/1/16 and may be subject to change